

[APPARATUS AND METHOD FOR GENERATING ELECTRICAL POWER IN A BOREHOLE]

Abstract

An apparatus and related method generate electrical power in a tubular housing, such as a drill collar, disposed in a borehole when drilling fluid flows through the tubular housing. The apparatus includes a stator adapted for being secured within the tubular housing against rotation relative to the tubular housing, a tubular rotor rotatably carried about the stator, and an impeller peripherally affixed to the rotor. The stator has an array of conductive windings therein, and is preferably an alternator stator. The rotor has an array of magnets therein, and is preferably an alternator rotor. Accordingly, drilling fluid flowing through the tubular housing when the apparatus is disposed therein engages the impeller and induces rotation of the rotor about the stator to generate electrical power.